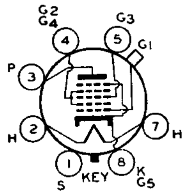


RCA-6L7



PENTAGRID MIXER AMPLIFIER

The 6L7 is a multi-electrode vacuum tube of the All-Metal type designed with two separate control grids shielded from each other. This design permits each control grid to act independently on the electron stream. This tube, therefore, is especially useful as a mixer in superheterodyne circuits having a separate oscillator stage, as well as in other applications where dual control is desirable in a single stage. The design of the tube is such that coupling effects between oscillator and signal circuits are made very small. This feature enables the 6L7 to give high gain in high-frequency circuits. For general discussion of pentagrid types, see Frequency Conversion on page 31.

CHARACTERISTICS

Heater Voltage (A. C. or D. C.)	6.3	Volts
Heater Current	0.3	Ampere
Direct Interelectrode Capacitances:*		
Grid No. 1 to Grid No. 3	0.12	μμf
Grid No. 1 to Plate	0.0005 *max.*	μμf
Grid No. 3 to Plate	0.025	μμf
Grid No. 1 to All Other Electrodes	8.5	μμf
Grid No. 3 to All Other Electrodes	11.5	μμf
Plate to All Other Electrodes	12.5	μμf
Cap	Miniature	
Base	Small Wafer Octal 7-Pin	

As Mixer

Plate Voltage		250 *max.*	Volts
Screen (Grids No. 2 and No. 4) Voltage		150 *max.*	Volts
Typical Operation:			
Plate Voltage	250	250†	Volts
Screen Voltage	100	150†	Volts
Signal-Grid (Grid No. 1) Voltage	−3 *min.*	−6 *min.*†	Volts
Oscillator-Grid (Grid No. 3) Voltage**	−10	−15	Volts
Peak Oscillator Voltage Applied to Grid No. 3 (Minimum)	12	18	Volts
Plate Current	2.4	3.3	Milliamperes
Screen Current	7.2	9.2	Milliamperes
Plate Resistance	Greater than 1		Megohm
Conversion Conductance	350	350	Micromhos
Signal-Grid (Grid No. 1) Voltage for Conver. Cond. of 5 Micromhos	−30	−45	Volts

** The d-c resistance in oscillator-grid-No. 3 circuit should be limited to 50000 ohms.

† Recommended values for all-wave receivers. * With shell connected to cathode.

As Amplifier

Plate Voltage	250 *max.*	Volts
Screen (Grids No. 2 and No. 4) Voltage	100 *max.*	Volts
Control-Grid (Grid No. 1) Voltage	−3 *min.*	Volts
Control-Grid (Grid No. 3) Voltage	−3	Volts
Plate Current	5.3	Milliamperes
Screen Current	6.5	Milliamperes
Amplification Factor	880	

PLATE RESISTANCE	0.8	Megohm
TRANSCONDUCTANCE	1100	Micromhos
TRANSCONDUCTANCE { −15 volts bias on Grid No. 1 / −15 volts bias on Grid No. 3 }	5	Micromhos

INSTALLATION

The base pins of the 6L7 fit the standard octal socket which may be installed to hold the tube in any position. For heater operation and cathode connection, refer to INSTALLATION for type 6A8.

APPLICATION

As a mixer in superheterodyne circuits, the 6L7 can mix the input from an external oscillator with the radio-input frequency to provide the desired intermediate frequency. For this service, design information is given under CHARACTERISTICS.

As a radio-frequency or intermediate-frequency amplifier, the 6L7 should be operated as shown under CHARACTERISTICS. In this application, the 6L7 has the advantage that avc bias can be applied to both the No. 1 grid and the No. 3 grid. With avc bias applied to the two grids, a small change in avc voltage produces a large change in the gain provided by the tube. For this reason the 6L7 as an r-f or i-f amplifier provides a flatter avc characteristic than a conventional pentode.

